ZANZIBAR PROTECTORATE

Annual Report

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Department of Agriculture

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DEPARTMENT OF AGRICULTURE: PROTECTORATE STAFF

Director ...	A. K. Briant, M.A. (Cantab), Dip. Agric. Cantab), A.I.C.T.A. (Trinidad).
Senior Agricultural Officer	G. E. Tidbury, B.Sc. (Lond.), A.R.C.S., A.I.C.T.A. (Trinidad).
Agricultural Officers ...	G. W. Anderson, B.Sc. (Agric.) (Edin.), A.I.C.T.A. (Trinidad).
	D. W. Winter, B.Sc. (St. Andrews), A.I.C.T.A. (Trinidad).
	G. D. Wilkinson, B.Sc. (Lond.), N.D.A.
	Vacant.
Agricultural Development Officers (Temporary)	R. G. Brett, Dip. Agric. (Harper-Adams) (up to 30th January, 1952).
	O. De Manbey (from 19th December, 1952).
Assistant Agricultural Officer	Othman Shariff, S.D.A., S.D.D. (Glas.).
Government Chemist ...	*Vacant.*
Veterinary Officer ...	Ahmed Rashid, M.R.C.V.S. (Edin.).
Manager of Plantations	I. G. C. Squire (seconded to Fruit Scheme as Field Supervisor).
Superintendent of Plantations	Ali Khamis.
Inspector of Produce ...	A. C. E. Callan.
Head Clerk ...	L. Paul.

TEMPORARY DEVELOPMENT STAFF

Farm Manager ...	Wing-Commander J. Barrett, D.F.C., Cert. Egerton School of Agriculture.
Agricultural Development Officer	K. A. Bowden, N.D.A., M.R.A.C.
Forestry Officer ...	T. A. Couppis, B.A. (Oxon.).
Fishery Officer ...	K. F. King.
Shipwright ...	G. Slater.

STAFF OF INSECT RESEARCH SCHEME

Entomologist ...	F. L. Vanderplank, B.Sc., Ph.D.
Scientific Assistant ...	Miss E. M. Tait, B.Sc.

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ZANZIBAR PROTECTORATE

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SECTION A. AGRICULTURE IN THE PROTECTORATE

1. General

There was less agricultural prosperity in 1952 than in the previous year. Clove prices remained exceptionally high but only a very small crop was reaped. Coconut prices were low for the greater part of the year. As a result, the general affluence which derived from the high prices and bumper clove crop of 1951, rapidly dwindled until for the second half of the year the purchasing power of the people became more normal.

Supplies of imported food were ample and, although rice was in short supply latterly, its increased price—Rangoon prices increased by 50 per cent during the year—restricted its purchase so that no great shortage was felt. Because of the reduction in consumption of rice, imports of the cheaper but less attractive foodstuffs, such as maize and sorghum meal, increased considerably towards the end of the year. Sugar was never plentiful—the ration was temporarily halved in March—and much of the available sugar was unrefined brown Mauritius sugar which was unpopular with consumers.

Local food production has been seriously hampered by lack of rain. The rice and other cereal crops were very poor indeed but root crop planting has been well done in spite of bad conditions.

At the close of 1952 the outlook is brighter than it was a year ago; a bumper clove crop is expected and copra prices are firmer than they have been for several months.

2. Weather

The year has been quite phenomenal and, as far as records are available, the driest ever recorded except for the famous drought year of 1898. The heavy and prolonged *vuli* rains of 1951 ended in the first few days of January, 1952, and thereafter conditions became exceptionally hot and oppressive. Old residents considered it to be the most trying hot season in memory. The *masika* rains broke late with heavy showers in the last few days of March, but continued light and fitfully until, at the end of May, the weather seemed more like the dry hot season than the cool wet one. About half, or even less, of the normal *masika* rainfall was received, and very dry conditions continued until a few heavy showers relieved a serious drought in October. The *vuli* rains, expected in November, were as light and ineffective as was the *masika* and the year ended with conditions very hot and dry again and little hope of relief for several months.

In Pemba and the wetter parts of Zanzibar about 60 per cent of the normal year's rainfall was received. In the drier eastern areas of Zanzibar less than half the average year's rain fell. This abnormally dry weather caused the failure of rice, maize and sorghum crops, almost complete losses of tree seedlings of all kinds planted in the field, and a very serious shortage of grazing for cattle in all areas.

3. Principal Crops

Cloves.—As was expected after the bumper crop of 1950/51, the 1951–52 crop was a small one. The last of the *vuli* part of the crop was reaped in January and, when the seasonal year ended in July, the quantities which had passed through the central market were as follows:—

Pemba	... ...	10,150,238 lb.
Zanzibar	... ...	1,606,235 ,,
	Total ...	11,756,473 lb.

These figures are equivalent to 3.35 lakhs of frasilas which is about half an average crop. It should be realised, of course, that this total does not include a proportion of the Zanzibar cloves which pass into the hands of dealers and exporters without passing through the Zanzibar public market.

The current crop, 1952–53, is also a small one. By the end of the year, when perhaps half to three-quarters of the crop had been marketed, production had reached 2,533,571 lb. or 0.72 lakhs of frasilas.

On July 1st, 1952, when the Clove Growers' Association published its fixed buying prices for the season, the price of cloves was left unchanged at Shs. 175 per 100 lb. in Zanzibar for fair quality cloves. The price of stems of commercial quality dropped to Shs. 17/50 per 100 lb. The clove prices are only nominal as the market price has been four times this figure. Stem prices had to be reduced in the face of adverse market trends for clove oil.

Prices of cloves in the open market were Shs. 400 per 100 lb. in early January and rose steadily to Shs. 900 in November. Thereafter the market was less firm but no considerable drop in prices is expected in the near future.

Exports of cloves in the calendar year amounted to 9,095,000 lb. or 2.8 lakhs of frasilas. The vast majority of this produce went to Singapore. Clove oil exports were 180,429 lb. shipped entirely to the United Kingdom.

Scanty crops and very high prices have inevitably led to a great deal of branch breaking during clove harvest and field officers have been at pains to keep this serious damage to a minimum especially as it is now known that die-back of cloves is caused by fungi which make an entry through wounds such as where the tissues are exposed by branch breaking.

In Pemba, where most of the cloves are produced, some 1,293 principal plantation owners were interviewed and the causes and control of die-back disease were explained to them. The District Agricultural Officer also organised two itinerant teams of skilled labourers who demonstrated the treatment of clove trees to control die-back. This consists of careful pruning and excavation of all diseased tissues from the limbs to remove all traces of fungus (both fungi known to be parasitic in clove trees, *Valsa* sp. and *Cryptosporella eugeniæ*, cause die-back) and the subsequent protection of the exposed wood with a suitable paint.

Die-back control was demonstrated on 1,829 trees, mostly owned by private persons, in all parts of Pemba. With increasing experience it became clear that this work could be most satisfactorily performed on the younger trees. Old trees, in which die-back is often far advanced, almost invariably need very drastic pruning and surgical treatment. This is most costly, very time consuming and, even when Government pays the cost, is very unpopular with plantation owners. The pruning teams therefore later restricted their demonstrations to the younger age groups. By the end of the year, the majority of Pemba planters had overcome their initial suspicion and distaste for this work and several leading Arabs were anxious for large numbers of their young trees to be cleaned up.

Sudden-death disease still remains largely a mystery. The Clove Research team are of the opinion that this disease results from mass infection of the roots of mature trees by spores of the fungus *Valsa* sp. and that the disease of saplings, which they have called "slow decline", results from replanting cloves in sudden-death areas still containing active fungal material. It is still difficult to reconcile the relatively slow advance, characteristic of *Valsa* lesions, with the rapid onset of "classical" sudden death and also the conspicuous absence of typical sudden-death disease from some areas where *Valsa* is known to be present and is causing die-back in a large number of the trees.

At the end of 1952, however, scientific research into clove diseases ceased and technological investigations to discover possible methods of restricting the spread of the disease and of preventing the occurrence of slow decline in saplings and poles planted in stricken areas are to take its place.

Coconuts and Copra.—The principal feature of the copra trade this year has been the relatively greater value of uncrushed copra as an article of export than of coconut oil. This placed coconut oil millers at a disadvantage in the market when bidding for copra of sufficiently high quality to pass the somewhat stringent export quality regulations. Exports of uncrushed copra increased as local producers, one Arab family in particular, learned that the care and skill needed to produce exportable copra paid good dividends. Exports of coconut oil decreased proportionately.

Representatives of the copra producers and of the oil and soap trade had rejected a further contract with the Ministry of Food for coconut oil at the end of 1951, but adverse market trends in early 1952 drove them to re-open negotiations and a new contract was operative for the last three quarters of the year. As this contract was designed to base current prices

on the average world prices for the preceding quarter, producers lost the advantage they should have enjoyed from the high world prices of the last quarter of 1951. As the oil millers were at a grave disadvantage when faced with rising prices for copra when they had a contract price for oil linked with the low world prices of the preceding quarter, the last few months of 1952 saw the trade operating a voluntary quota system which limited exports of uncrushed copra to 22½ per cent of the production. At the end of 1952 the growers and trade representatives agreed that there should be no contract for 1953, nor any other restriction which would affect the free sale of both copra and oil. The millers held over much of their oil produced at the end of 1952 for shipment in 1953.

Exports for the year were as follows:—

	Exported		*Copra equivalent*	
Coconut oil	105,251 cwt.	...	8,771	tons
Coconut cake	97,507 „	...	–	„
Soap	1,952 „	..	97.6	„
Copra	2,560 tons	...	2,560	„
		Total	11,428.6	„

Since some oil was held over at the end of the year, the year's production is considered to be above average.

The Ministry of Food's contract prices for oil for the last three quarters of the year were £68, £54 and £55.10 per ton, naked, f.o.b. 6 per cent F.F.A. Open local market prices for F.M. copra, fell from Shs. 60 per 100 lb. to Shs. 27 in the first quarter, remained at a low level until July, then rose gradually to a figure of about Shs. 50 at the end of the year. The average price obtained for Government Plantations copra was Shs. 36/31, only about 60 per cent of last year's average price.

The political deadlock which had held up the formation of the Copra Board was overcome early in the year. The new Board met for the first time on 19th May, since when it has functioned smoothly. This enabled work to go ahead on the Coconut Products Factory and the much valued service of providing skilled masons free to kiln builders was re-commenced.

Research work on the disease of coconuts caused by the insect pest, *Theraptus* sp., continued and is described in detail later in this report.

4. Minor Export Crops

Exports of chillies maintained their upward trend with an export of 1,313 cwt., 47 per cent more than last year. The Clove Growers' Association maintained their guaranteed buying price of Shs. 120 per 100 lb. until 1st October, after which it was lowered to Shs. 70. There was no appreciable drop in world prices although the market outlook at times was unsatisfactory.

The overseas demand for kapok was also unsettled but exports were reasonably well maintained at 542 cwt. compared with 597 cwt. in 1951.

Tobacco exports increased to 28,385 lb. The Clove Growers' Association remained, officially, the sole buyers on behalf of a Government monopoly in Somalia but considerable quantities of coil tobacco undoubtedly leave Zanzibar through other channels.

Coir fibre and rope, fresh fruit and other minor products again added useful contributions to the Protectorate's exports but mangrove bark stripping is still prohibited pending recovery of the forests from unregulated exploitation in the past.

Of the newly introduced crops, derris exports were rather small at 1,240 lb. but cocoa came into the picture with a small commercial consignment of 450 lb. which sold at Shs. 285 per cwt. on the London market. The Clove Growers' Association handles the marketing of both these crops.

Seaweed, its culling and export now controlled by a licensing system, is becoming of increasing importance. Some 144 tons was exported, valued at £6,840. After having received complaints as to quality exporters now voluntarily arrange for their seaweed to be tested for moisture and extraneous matter by the Government Chemist before export and try to work to a standard acceptable to the buyers. One exporter prepared an attractive consignment of carefully washed and fully dried weed for which he was offered a considerably enhanced price.

5. Food Crop Production

The rice crop bore the brunt of the unseasonable weather. The heavy and prolonged *vuli* rains of 1951 hindered Zanzibar cultivators from preparing their land in good time. As a result, not only was the acreage much reduced but planting had to be done much later than usual. Then, when the *masika* rains failed, that part of the scanty late-planted crop which managed to mature gave a poor average yield of about 1,200 lb. per acre and an overall crop of 1,780 tons of paddy, about a quarter of a normal crop. In Pemba, where later planting is the rule, the acreage planted was not much depleted but the crop had so short a rainy period for vegetative development that it came into ear prematurely with a very low average yield of 626 lb. per acre and an overall crop of 3,451 tons of paddy, about 60 per cent of a normal crop. The Protectorate total of 5,231 tons of paddy was 40 per cent of the average yield of the previous five years, a serious set-back to local food production.

At the end of this year preparation began betimes in Zanzibar for the 1953 season. In the Cheju and Chaani plains in Zanzibar and to a lesser extent in Pemba, a few cultivators formed themselves into growers' cooperative societies some of which were assisted by tractor ploughing. This is described in more detail later in this report.

The other cereal crops—maize, sorghum and bullrush millet—produced very small yields in most areas. This was particularly so in the coral-rag areas where the shortage of rain was most felt. Many coral-rag cultivators also cleared large areas of bush for *vuli* planting in anticipation of heavy *vuli* rains which unfortunately did not materialise.

Root crop planting, on the other hand, went on throughout the year, and, by taking advantage of showers, large areas of cassava and sweet-potatoes were established. A special drive for root crop planting was successfully undertaken in Zanzibar. Planting orders for root crops as well as for rice were promulgated under the Defence Regulations.

The following table, showing the quantities and costs of foodstuffs passing through the main market of Zanzibar town indicates the production of locally grown foodstuffs compared with previous years.

	1950	1951	1952
Vegetables, baskets	60,350	80,942	102,213
Average price per basket	Shs.4/07	Shs.4/51	Shs.4/33
Fruit, baskets	127,647	128,877	94,337
Average price per basket	Shs.4/24	Shs.5/23	Shs.4/84
Staple starchy foods, baskets ...	108,469	159,067	183,393
Average price per basket	Shs.8/23	Shs.10/78	Shs.8/45

Fruit production fell but the growing of vegetables and starchy foods —mostly root crops—increased very satisfactorily. Prices were slightly less than last year in spite of a general increase in the cost of living.

6. Animal Husbandry

Importations of animals into the Protectorate, compared with previous years are shown in the following table:—

	1950	1951	1952
Cattle	3,320	3,904	3,463
Goats	12,509	13,771	11,111
Sheep	1,964	2,370	2,100
Donkeys	103	80	6

These figures include 209 cattle, 317 goats and 52 sheep imported by Pemba direct from the mainland. This was made possible for the first time in July this year when a quarantine station was opened at Wete. The station enables Pemba to get part of its meat supply more expeditiously and also partly relieves the grazing pressure in the Zanzibar quarantine station where Pemba imports were previously quarantined.

The following tables show the numbers of animals recorded as having been slaughtered for meat during the year:—

Zanzibar Town Abattoir

	Oxen	*Cows*	*Calves*	*Goats*	*Sheep*	*Pigs*
Local stock	112	163	49	3,122	22	84
Imported stock ...	2,813	5	14	8,379	2,244	–
Total ...	2,925	168	63	11,501	2,266	84
1951 Total ...	2,805	139	31	12,126	2,255	211
1950 Total ...	2,728	68	64	13,331	2,100	257

Other Areas

(Cattle only and figures approximate)

	1950	1951	1952
Pemba rural areas	1,083	867	1,130
Pemba townships	1,107	931	918
Zanzibar rural areas	409	524	435
Total ...	2,599	2,322	2,483

The Zanzibar town returns show an increasing consumption of beef and a decreasing consumption of goat meat. Other than this meat consumption has remained much the same as in preceding years.

The total imports of slaughter stock into Pemba were 640 cattle, 126 sheep and 942 goats. These figures are some 35 per cent less than those of last year when a large clove crop increased the purchasing power of the people. This change was also reflected in the cost of local slaughter stock in Pemba which fell from ridiculously high prices in the neighbourhood of Shs. 1,000 in 1951, to between Shs. 300 and Shs. 400 in 1952.

There were no outbreaks of infectious animal diseases although several sporadic outbreaks of infectious poultry diseases caused heavy losses. These, in the opinion of the Veterinary Officer, were largely caused by faulty husbandry.

The mobile veterinary unit continued to pay regular weekly visits to various places in Zanzibar Island to examine and treat animals in the field. By far the most important disease met with has been trypanosomiasis. The excellent results obtained from injections of antrycide methyl sulphate make this treatment very popular with cattle-owners and the work of the mobile unit is greatly appreciated. In all some 478 cattle were treated against trypanosomiasis this year. A few cases of caprine, ovine and canine trypanosomiasis were also treated.

Dipping against East Coast Fever was regularly carried out in the case of commercial dairy herds and all animals grazing on Government land. But peasant owners of small herds of cattle still maintained their aversion to dipping and, apart from mild encouragement in Pemba, no steps were taken to enforce dipping in the country districts. The total numbers of privately owned cattle dipped were—

	1950	1951	1952
Mpigaduri	7,594	7,284	6,705
Mtoni Dairies	35,240	38,719	44,960
Mazizini	37,757	31,961	23,469
Kombeni	480	61	–
Kibonde Mzungu	–	–	1,780
Hindu Gawshalla	–	–	225
Hanyegwa Mchana	80	–	–
Ole, Pemba	8,901	6,728	7,983
Vitongoje, Pemba	9,371	11,123	7,777
Konde, Pemba	4,370	3,282	707
Kiuyu, Pemba (spraying) ...	–	–	12,191

The Veterinary Officer also reported the occurrence of mastitis amongst the commercial dairy herds, helminthiasis amongst young stock and several cases of filariasis in dogs.

The regular purchase of hides and skins by a local firm of exporters ceased during the year, and, so far, no regular marketing arrangements have been made elsewhere. Local producers appear to have had no difficulties in disposing of their hides and skins, however. Quality remained fair and good use was made of the enlarged drying shed in Zanzibar and of the small township sheds in Pemba. The following numbers of hides and skins were suspension dried in the Government Shed under shade:—

	Hides	*Skins*
Zanzibar, from abattoir	3,155	13,703
Zanzibar, from rural areas... ...	419	3,400
Wete, Pemba	497	626
Konde, Pemba	70	–
Chake, Pemba	570	384

The total value of hides and skins exported from the Protectorate was £10,803 compared with £13,141 last year and £10,340 in 1950.

SECTION B. THE WORK OF THE DEPARTMENT OF AGRICULTURE

1. Staff

The Director, Mr. A. K. Briant, returned from vacation leave on 14th June. Mr. G. E. Tidbury, who had been in charge of the Department, then reverted to his substantive post as Senior Agricultural Officer. Mr. G. W. Anderson, who had acted as Senior Agricultural Officer, went on vacation leave.

The staff position in the districts was more stable than usual, Mr. G. D. Wilkinson being in charge of Pemba, Mr. D. W. Winter of Northern Zanzibar and Mr. K. A. Bowden of Southern Zanzibar throughout the year. Wing-Commander J. Barrett, D.F.C., was in charge of the Kizimbani Experimental Station during the whole year.

The Veterinary Officer, Mr. J. C. Alley, was transferred to Tanganyika in March and his place was taken permanently by Mr. Ahmed Rashid. Mr. Ali Khamis, another officer of local birth, took over permanent charge of the Government Plantations in March when Mr. I. G. C. Squire went on vacation leave. Mr. Squire, on his return from leave in November, took charge of the Fruit Scheme.

Mr. Othman Shariff returned from his studies at Glasgow University in March, and, after a study visit to Kenya, took charge of the Tsetse and Trypanosomiasis Survey on 1st July.

Mr. T. A. Couppis, Forest Officer, was on duty throughout the year and was assisted after June by Mr. A. A. Wadud who returned from his forestry studies in Pakistan.

The Fisheries Officer, Mr. K. F. King, returned from his vacation leave in January and went to the Seychelles in April and June to advise the Colonial Development Corporation Fisheries Officers there. Mr. A. C. E. Callan, Inspector of Produce, and Mr. L. Paul, Head Clerk, were on duty throughout the year.

In December, Mr. O. de Manbey, temporary Agricultural Officer, was appointed to fill a long standing vacancy. The post of Government Chemist remained vacant.

The incidence of leave was such that little disturbance to district work was caused and extension work was able to proceed satisfactorily.

2. The Development Programme

The Development Programme continued to take precedence in departmental activities.

A. Crop Development

(i) Crops other than Cloves and Coconuts

Although the area under cocoa was extended again by planting out 10,872 seedlings on Government land and 10,367 seedlings on privately owned plantations, the failure of the *masika* and *vuli* rains caused the death of more than half the newly established plants.

Plantings of shade trees and windbreaks, largely of *Peltophorum ferrugineum*, was continued in all cocoa areas and the beneficial effect of shade can now be observed. There is still a great need for more hedges as windbreaks and the dry weather made it difficult to establish cinnamon, the plant usually used for this purpose.

In the forest at Kidichi an observation plot of cocoa is making good progress and was extended. The Dole forest plot is disappointing however.

At the beginning of the year a small consignment of cocoa was sent to England for sale. This amounted to 450 lb. and was sold at the rate of Shs. 285 per cwt. The brokers described this sample as "dark greyish coated, brown break, rather cooked flavour due overfermenting or artificial drying". This was somewhat disappointing and must be attributed to the great difficulty of fermenting small quantities of cocoa.

During the year a fermentary was built at Selem for the preparation of both Government and private cocoa. The use of this fermentary and the availability of larger quantities of raw cocoa greatly improved fermentation and, at the end of the year, a consignment of 778 lb. of very much better quality was prepared for shipment.

A small but severe outbreak of a fungal disease caused the death of seventy-four trees before rigorous destruction of infected material and spraying with fungicide ended the outbreak. A species of *Fusarium* and, to a lesser extent, *Botryodiplodia theobromæ* were both isolated from the dying trees.

Investigations into the vegetative propagation of cocoa have continued throughout the year.

There has been no noticeably increased interest in cocoa growing on the part of local agriculturists. A faithful few continue to plant but no great enthusiasm is expected until regular sales of cocoa are being made.

Coffee.—The demand for planting material of this crop continues to increase: some 8,230 seedlings were sold to the public from the nurseries. The Nganda-type robusta introduction from Uganda makes fair progress in spite of bad weather.

Ylang-ylang.—The acre block at Kizimbani, planted in 1949, produced 337 lb. of fresh flowers which yielded, on distillation, 0.57 per cent of oil. This oil has been sent to London for examination by perfumers but no report has yet been received. The block has been extended and the growth of the seedlings as well as of the three-year-old trees leaves nothing to be desired.

A block of ylang-ylang was also planted in the coral area at Hanyegwa Mchana but establishment was not successful owing to the dry weather.

Derris.—Interest in derris cultivation was stimulated when the sales of a 1,452 lb. consignment to Australia were finalised. The Clove Growers' Association, which markets derris root on behalf of growers, had paid a 50-cent per pound advance on delivery. The rotenone content of the consignment was 8 per cent, a very high figure, and enabled the Association

to pay an additional Sh. 1/30½ per pound to producers. Free issues of rooted cuttings were made to those interested in planting the crop and, together with Government planting, nearly 100,000 cuttings were established this year. Local plantation owners still regard derris as a doubtful novelty and dislike planting a ground crop which takes 2½ years to mature.

Chillies.—A combination of exceptionally unsuitable planting weather and unsettled market prospects at planting time reduced interest in this crop to some extent. Nevertheless 270,000 free seedlings were issued from departmental nurseries.

The manurial and spacing experiment at Hanyegwa Mchana failed.

Although there has been slight setback this year, there is little doubt that chillie production is increasing and becoming an important item in the economy of the coral areas. Exports have increased steadily from 5 tons in 1947 to 65 tons in 1952.

Jute substitutes.—After fairly encouraging reports from the Colonial Products Advisory Bureau and the British Jute Trade Research Association on samples of *Urena lobata* fibre produced at Kizimbani, it was most disappointing, when prices fell at the beginning of the year and the first small commercial consignment was sold, that it only realised £60 per ton c.i.f. ex quay Dundee.

The following report was received on this consignment:—

> "It seems impossible for any one, including the growers of *Urena lobata* in the Belgian Congo, to grow *Urena lobata* of uniform quality with the result that they have to spend a great deal of time and money in grading into three distinct grades.
>
> No. 1 grade can be classed as long fibre free from root and blemish, of excellent lustre and colour. This grade can be mixed with jute to approximately 25 per cent and spun into the usual warp and weft yarn.
>
> The second grade quality may be sparingly used in the batch up to about 15 per cent, but frequently spinners will use it in sacking yarns as distinct from hessian yarns.
>
> The third quality with its very heavy red root and bark adhering to the fibre, can only be used in sacking weft."

While it is fully realised that there is much to be learned about this crop in order to produce a better quality, nevertheless prices in the neighbourhood of £60 per ton represent about £20 per acre less the cost of shipment. This figure for a crop which requires a great deal of labour and skill in preparation, is unlikely to attract Zanzibar agriculturists. No further work is at present envisaged with *Urena lobata*.

There is also every indication that neither Mauritius hemp nor Ramie is likely to prove a success in Zanzibar and trials of these fibres have also been abandoned.

Cotton.—A further trial of cotton was made at Hanyegwa Mchana and, in spite of most unfavourable weather, a crop was produced. At harvest time it was inspected by Dr. J. B. Hutchinson, C.M.G., Sc.D., F.R.S., the Director of the Namulonge Research Station of the Empire Cotton Growing Corporation.

The varieties grown in the main experiment were both provided from Namulonge. One was C(50)20 which is a recent selection from B.P. 52, successfully grown here in 1951, and the other was A.7233, a highly jassid-resistant long-staple hybrid type. These were given combined dressings of sulphate of ammonia and sulphate of potash, each at three levels.

The highest plot yield was over 500 lb. of seed cotton per acre, a fair yield in such a dry season. Variety A.7233 yielded significantly better than C(50)20 and potash produced a significant linear response.

Dr. Hutchinson, in his report, pointed out that the season was a bad one, the stand of cotton poor and yields low. Stainer and jassid attack was bad but blackarm disease was not present. A.7233 was immune to jassid attack. Dr. Hutchinson recommended continuing the work with cotton, using closer espacements and including some plots on the coral-rag to be planted by local cultivators.

Samples of both varieties of seed cotton were subsequently sent to the Shirley Institute where they were ginned, spun and tested. The full report has not yet been received but it appears that Zanzibar cotton was stronger but not so good in yarn appearance as cotton of the same strains grown in Uganda.

Some Sea Island cotton was also grown for trial at Hanyegwa this year but was practically wiped out by jassids.

Trial plots of cotton on the coral rag adjacent to Hanyegwa grew well. Grasshoppers hindered establishment and monkeys were again troublesome in picking off immature bolls, but the plants were freer from pests and the cotton less badly stained than that of the main plot on the open *uwanda.*

Vetiver Grass.—A large sample of dried roots of Vetiver grass was sent to the United Kingdom. No report has yet been received of the quantity and value of the oil obtained from it.

Kapok.—A 2-acre plot of a St. Vincent variety was established at Hanyegwa Mchana and appears most promising. The 1949-planted local (Ndagaa) selection on the same station commenced bearing. This block is being kept cut back just above the 3rd tier of lateral branches.

Rice.—Fertiliser trials were held on namo soil at Cheju and Muyuni. Previous results from these two namo areas have been dissimilar. This year's results confirmed those of past years that, whereas Cheju soil needs both phosphate and nitrogen, Muyuni soil apparently needs only a small dressing of nitrogen when rice is grown.

Demonstration plots of the use of fertilisers on rice were established at several places. Yields everywhere were much reduced by the dry weather but it is of interest to record that rice planted on the sites of last year's fish ponds at Kibonde Mzungu yielded very well indeed at 1,980 lb. per acre whereas nearby plots, which had not been under water for a year, yielded at 376 lb. per acre.

The beetle which damaged rice seedlings last year, *Heteronychus andersoni*, caused practically no damage this year. Trial plots of various seed dressings were laid down in areas where damage was expected but, as the pest was absent, gave no useful results.

Variety trials were conducted at various stations.

Maize.—Maize was the subject of a series of fertiliser trials conducted on kinongo (terra rosa) soils to seek further information as to the potash status of these soils. Hitherto, conflicting results had been obtained. This year, similar experiments were laid down at several places. All these experiments showed small and statistically insignificant responses to potash except one where an attack by stem-borers was experienced. Here potash apparently assisted the plants to resist and recover from the attack. This is thought to explain the earlier conflicting results. Broad leaved plants on the other hand, do appear to respond to potash on these soils.

A demonstration of the value of composting the maize crop was given at Makunduchi.

The rust *Puccinia polysora* was first observed in Zanzibar on 1st August, only a few weeks after the first recorded Kenya outbreak. It is now widespread in the Protectorate including Pemba Island.

Cassava.—The Amani hybrid cassavas (resulting from crosses between cassava and *M. glaziovii*, *M. dichotoma* and tree cassava), which had been replanted after last year's initial harvest, were harvested for the second time and carefully selected. The eight most promising varieties were replanted at Kizimbani as a full-scale variety trial and all clones were planted at Makunduchi where the different growing conditions of the dry, kinongo areas call for a separate selection. These hybrids do not appear to be fully immune to the virus diseases of streak and mosaic but apparently bear well in spite of infection.

Sunflowers.—A spacing trial at Hanyegwa Mchana indicated that the closest spacing used (30″ × 18″) gave the highest yield (804 lb. per acre).

Demonstrations of the use of fertilisers and compost and of improved varieties of other annual food crops such as sorghum, yams, etc., were planted on the demonstration plots.

(ii) Clove Regeneration.

The following numbers of clove seedlings were issued from departmental nurseries this year:—

	Zanzibar	*Pemba*	*Total*
Sold (at 5 cents) ...	68,871	39,500	108,371
Issued free	39,170	12,175	51,345
Total ...	108,041	51,675	159,716

The demand for clove seedlings remains very great, especially since the price of cloves has risen so high. This year 30,000 more seedlings were issued than in 1951. For the 1953 distribution some 307,000 seeds have been planted. Part of the financial provision for clove nurseries is received from the Clove Growers' Association. During the year, arrangements were made to assist the Association in a bonus planting scheme, mainly for clove seedlings, which is to be commenced in 1953.

(iii) Copra Production.

Owing to the lateness of formation of the new Copra Board, funds were not available last year for the construction of coconut nurseries and so no coconut seedlings were available for distribution this year.

From Copra Cess funds a service was maintained for the greater part of the year by which trained masons are provided free to those who wish to repair old copra kilns or build new ones. Supplies of certain kiln building materials are also made available at cost price. During the year some fifteen old kilns were repaired and ten new ones constructed. The Copra Board also provides part of the cost of two trained inspectors who regularly visit copra makers and advise and assist them to impove their produce.

(iv) Afforestation Survey, Anti-erosion and Utilisation of Wanda Areas.

Financial provisions under this head are now used for the maintenance of the forest nursery at Migombani where, in 1952, the following numbers of seedlings were raised:—

Casuarina	55,650
Eucalyptus	40,000
Peltophorum	9,000
Chlorophora	6,000
Acacia	2,020
Neem	800
Total ...	113,470

The more recent schemes for afforestation and utilisation of the uwanda areas are reported on separately below.

B. Crop Research

(i) Clove Research

This has been the last year of the Clove Research Scheme. Die-back disease of cloves, caused by *Cryptosporella eugeniæ*, has been clearly demonstrated and a method whereby its control could be achieved worked out at the Clove Research plantation at Jendele.

Sudden-death disease research is, unfortunately, not so far advanced. The Director of Clove Research is of the opinion that the fungus *Valsa* sp. is probably the causal organism of the disease. This fungus has been shown to cause a type of die-back (less active than *Cryptosporella* die-back) and has also been found in the roots of unthrifty young trees established on old sudden-death areas and having the so-called Slow Decline disease. Symptoms of typical sudden-death of mature trees have not yet been reproduced by artificial inoculation with *Valsa*.

The Director of Clove Research considers that the circumstancial evidence of *Valsa* being the cause of sudden-death is sufficiently strong to discontinue scientific research into the problem. Plans have been prepared for two long-term field experiments to be conducted by this department. One will be situated in Pemba and consist of various combinations of such treatments as trenching, liming and immediate removal of dying trees with a view to finding an effective means to prevent the spread of sudden-death. The other, in Zanzibar, will be conducted on old sudden-death land and consist of various combinations of such treatments as liming, soil disturbance, planting with ground crops for varying lengths of time, all combined with the removal from the soil of as much root material from the old trees as possible, to find a means of re-establishing cloves which would not later be affected by "slow decline".

(ii) Coconut Pest Research

During 1952 the Director of Clove Research was responsible for the scientific direction of investigations into the *Theraptus* pest of coconuts by the Department's Entomologist.

In the laboratory, cross-breeding experiments have indicated that *Theraptus* from Zanzibar, Pemba and the mainland constitute one species. There may be varietal differences. Studies of the life histories of this insect and associated ants have been continued. Laboratory tests have been made using various formulations of the newer insecticides.

In the field, observations on the feeding behaviour of *Theraptus* have led to the discovery of a wider range of host plants. The insect appears to be particularly fond of young mango fruits. Certain parasites and predators of *Theraptus* have been observed. It has also been found that certain other insects, notably an ant (*Polyrhacis* sp.) a Lepidopterous larva and a weevil, also cause losses of young nuts hitherto ascribed exclusively to *Theraptus*. The relative importance of these other pests is not yet known nor to what extent control measures applied to *Theraptus* will also deal with these other insects.

The only experimental control measure so far applied on a large scale is a double aerial spraying of 500 acres of coconut plantation which was done in September and October. Officers of the Colonial Insecticide Research Unit undertook this work. A D.D.T.-in-oil formulation was used and full scientific observations as well as costings were made. The results will not be apparent for some months yet.

In other spraying and dusting experiments, several thousands of palms have been treated with various formulations of D.D.T. and other insecticides. The Entomologist considers that the most effective means of applying insecticides will prove to be by mechanical mist spraying.

Attention has also been paid to the problem of effecting the control of *Theraptus* by a return of *Occophylla* ants to areas from which they have been driven by *Anoplolepis* and *Pheidole* ants. It is realised that natural biological control in this way if it could be carried out effectively would be by far the cheapest and most effective means of controlling *Theraptus*. To this end, spraying experiments for the eradication of the

non-useful ants are in progress: the insecticide Dieldrex is proving very effective for this purpose. Banding experiments are also being undertaken to protect young colonies of *Oecophylla* which become established artificially or naturally in the crown of the coconut palms.

C. Stock Development

(i) Disease Control

In 1952 a small Colonial Development and Welfare grant was made for a survey of tsetse and trypanosomiasis in a typical plantation area. The progress of this work is described later under a separate heading.

The mobile unit of the Veterinary section continued its work throughout the year in Zanzibar island, treating positive cases of trypanosomiasis with antrycide with great success. This service is very popular indeed with cattle owners.

While there has been no change in the dipping situation, cattle owners on the whole being quite unwilling to bring their animals to be dipped, a survey has been conducted in four areas of Pemba to ascertain the extent of calf mortality due to East Coast Fever. In this survey an attempt has been made to diagnose the causes of all calf ailments and to make *post-mortem* examinations of all dead calves. The work continued for a complete year. The results have not yet been fully worked out but it appears that, although East Coast Fever is by far the most serious calf disease, attacking all calves and causing more deaths than all other diseases put together, the recovery rate is much higher than was hitherto supposed. If calves are living under moderately healthy conditions a recovery rate of over ninety per cent is observed. It is doubtful therefore whether it would be wise to enforce a policy of tick eradication, in the face of bitter opposition on the part of the people in order to achieve a reduction in what is really but a small death rate and at the cost of creating a population of adult cattle, still susceptible to the disease and highly likely to die if they later become attacked. It is arguable that a ninety per cent immunity to an endemic disease is well bought for a ten per cent loss of calves.

Nevertheless, some reduction in tick numbers by dipping appears to be highly desirable as it does assist in maintaining cattle in better health. The problem appears to be how to encourage sufficiently frequent dipping or spraying in order to reduce tick numbers (and a reduction of other troublesome insects such as camel flies) without resorting to compulsion since there appears to be no great justification for compulsory measures.

Cattle spraying has been tried this year at Kiuyu in Pemba as an alternative to dipping. It has a few manifest advantages over dipping and, provided supervision is adequate, is fully as effective for purposes of tick reduction.

(ii) Development of Cattle Industry

At the end of 1951 a noticeable loss of condition of the stock at Kizimbani was attributed to heavy overstocking resulting from the steady increase in the numbers in the herd. In addition to the general loss of condition which was most serious with newly weaned calves, there were more cases of parasitic gastroenteritis caused by worms.

Early in 1952, one hundred head of stock, mostly weaners and heifers, were temporarily transferred to Hanyegwa Mchana. The cattle left at Kizimbani showed an immediate improvement in condition and for the remainder of the year their health was excellent. The very dry weather of 1952 was also conducive to good health as the period of wet, cold weather was unusually short.

Although the culling standard was raised to 2,000 lb. at the end of last year, lack of adequate grazing restricted milk production to some extent. Nevertheless the average daily milk index again showed a slight increase to 7.7 lb. The average milk yield (in 305 days maximum) for cows completing their lactations this year rose sharply from 1,836 lb. in 1951 to 2,313 lb. in 1952—a very creditable figure which is now more than double that of 1944 and previous years.

A few bulls of good parentage were sent out from Kizimbani to rural areas where dipping facilities exist for stud service. A group of five young bull calves of good parentage were sent to Selem where, as was hoped, they contracted and recovered from East Coast Fever. When adult, these bulls will be sent for stud purposes to areas having no dipping facilities. The Kizimbani herd is much superior to the general run of local cattle and it is now time to offer service facilities to the cattle owners of the Protectorate.

(iii) Pasture Improvement

There have been no activities of particular interest to report.

D. Education

No "Young Farmers" course was held at the Kizimbani school this year. The training of three pupils for later appointment in the department continued. Boys from the Seyyid Khalifa rural middle school visited the Kizimbani station on several occasions as part of their studies. Plans were prepared for the establishment of a school farm near the station.

E. Fisheries Development in Zanzibar and Pemba.

The motor fisheries vessel "Annajah" was completed and commissioned during the year and commenced a programme of practical fishery investigations in local waters. She is sixty-eight feet overall in length, with a beam of eighteen feet six inches and a loaded draft of eight feet aft. She was built wholly in Zanzibar and is the first ship of her class (Scottish Seiner type) to be built in the Colonies.

The "Annajah" is powered by a 120 h.p. diesel engine and has a three-speed powered winch and an echo sounding unit. Her total cost was approximately £13,000 which is estimated to be at least £4,000 cheaper than the cost of a similar vessel purchased from the United Kingdom.

The fishing techniques employed fall into three main classes—netting, set lining and trolling—but each division has several variations. Net fishing covered the use of beam and otter trawls, gill nets, trammel nets, and purse seines. Set lining was used mainly for shark catching. Set lining in deep water with steel wire lines has still to be tried.

Trolling, using several types of spoons and feather jigs has so far proved the most successful method of obtaining fish in any quantity.

A fish curing station has been built at Mtoni and the early catches of the "Annajah" have been processed by salting and drying.

Work has commenced on a smaller powered fisheries vessel of between thirty-five feet and forty feet in length which will serve as a prototype if the use of powered fishing craft develops in these waters. The cost of this vessel will probably be in the neighbourhood of £1,300.

All work on the fish ponds, both marine and fresh water, ceased during the year. Neither type of fish farm appeared to be capable of economic fish production under Zanzibar conditions.

A census of fishermen and their catches of fish was conducted in Pemba Island.

F. Development of Forest Resources.

The adverse effects of the very dry weather this year have been most felt in the forestry section. Although planting continued according to programme, a very high proportion of the seedlings planted out subsequently died.

The forests of Kichwele-Pangeni and Walezo-Chumbuni, which are being planted with prison labour, were extended by 130 and 20 acres respectively and a total of nearly 45,000 seedlings, mainly Eucalyptus and Casuarina, were planted. The very infertile conditions in both these estates became more noticeable and, although the young trees flourish in a few small, less infertile spots, the condition of the majority is very disappointing. Some fifty acres of *uwanda* was planted at Jendele.

The Forest Officer has been engaged on a survey of the catchment area of Masingini ridge where erosion is a serious problem. Seventeen acres of Government land in this area were planted with Casuarina trees.

In the forest at Jozani a start has been made to re-stock the better areas with *Calophyllum inophyllum*, a species natural to this area, by transplanting seedlings and sowing seed at stake. Large numbers of *Pandanus* have been poisoned.

In Pemba island, a reconnaissance is in progress in the forest at Ngezi with a view to preparing plans to fell the standing timber in as profitable a way as possible and plant up more valuable species.

The problem of lime-burning has been much considered this year. The indiscriminate felling of bush in the coral-rag areas to provide fuel for lime-burning is causing disquiet. Not only is the proportion of felled to regenerating bush most unsatisfactory but too frequent re-felling changes the character of the vegetation and a useless scrub with grassy patches replaces high bush. Exports of lime have been temporarily prohibited for this reason. Meanwhile experiments were conducted at Hanyegwa Mchana and elsewhere to find a better type of lime kiln with a more economic fuel consumption. No success has yet been achieved and the problem continues to be an acute one.

G. Development of Citrus Fruit Industry.

Here again the drought hindered work. The young plants established in the pilot plot have had more casualties than was expected and the growth of many of the survivors has been slowed up. The percentage

"takes" in the budding nursery has also been well below normal owing to the dry conditions. However, the programme has not fallen behind schedule although it now appears that the full three years will be necessary for the nursery work, as was originally planned, instead of two years as was hoped.

Of the 120,000 stocks planted out from the nursery last year, 43,210 were successfully budded. This is more than half the total number in the scheme (83,000) but this year's transplants from the nursery, for budding in 1953, have been decimated by drought and badly attacked by scab. Only a very high rate of "take" next year will enable another 40,000 to be completed.

The 20-acre pilot plot was planted up and included an experiment to compare budded with seedling limes combined with a fertiliser trial. Subsequent growth of the budded limes has been excellent but there were many orange casualties. Wind-breaks of cassia and cinnamon and a nurse crop of bananas were planted to shelter the young citrus on this rather exposed site.

Two hundred and fifty-one applications to take part in the scheme for receiving free planting material and a maintenance bonus have been made and the Supervisor, since his return from leave, has been inspecting the applicant's land. So far 140 have been rejected as unsuitable. It is expected that the number of plantations finally selected will be sufficient to accommodate the full issue.

H. Development of a Cattle Industry in Uwanda Areas.

By births, purchases, and transfers from Kizimbani, the beef herd on the 1,500-acre *uwanda* plain at Hanyegwa Mchana has been built up from 124 head in January to 259 at the end of the year. There is still room for expansion as it is now thought that this area will support more than the 300 head originally envisaged in the scheme.

Rotational grazing of the sward of *Heteropogon contortus* has been controlled by means of an electric fence and, in this way, the nutritional value of the pasture has been maintained. At the end of the year, however, the drought reduced grazing to a very low ebb and the herd rapidly lost condition. Health was adversely affected by the weather and seventeen deaths occurred—a rather high figure although it includes two deaths in a motor accident en route for the farm and two other accidental deaths. Trypanosomiasis is clearly the major health problem as the surrounding bush is full of tsetse flies. Based on the average monthly stocking rate the percentages of trypanosomiasis cases have been as follows:—

	1950	1951	1952
Average head of stock ...	57	93	218
Total No. of cases in year	41	98	121

These figures show a great improvement on last year and are probably due to the lack of overcast, rainy days when the fly can leave the bush for longer periods.

A wind-pump was erected and troughs built. This has proved highly successful and provides excellent water at the rate of about 560 gallons per hour in a moderate breeze. The provision of ample water caused a noticeable improvement in the condition of the stock when the work was completed at the end of the year.

Within the walled paddocks of the station investigations into stocking rates continued. In April, five beasts had completed a whole year in the fourteen-acre paddock thus indicating a possible minimum stocking rate of one animal to 2.8 acres. These five beasts gained weight at 6.4 oz. per head per day over the year. At periods when the grass was growing very rapidly, extra stock were introduced to stop the grass flowering and becoming coarse and wiry. Altogether the fourteen-acre paddock provided for 4,273 cattle days and 78.5 lb. per acre live weight gain.

In April, at the end of the grazing year, the head of permanent stock was doubled in order to see if fourteen acres, properly managed, would support ten animals. But the drought brought this rather optimistic experiment to a close in September.

In connection with the cattle scheme, experiments with ensilage were conducted at Hanyegwa Mchana. Last year white and yellow maize grown for silage provided ten and six tons per acre respectively of ensilable material. When fed early this year the silage was found to be very palatable and, in quantity, worked out at 2.5 tons and 0.3 tons per acre for white and yellow maize respectively.

This year 8,804 lb. of maize was ensiled eight weeks after sowing and produced 5,562 lb. per acre of good silage later in the year. A pit silo was used for this work: a small tower silo proved unsuccessful.

I. Experiments with Agricultural Tractors.

The purpose of this scheme is to demonstrate the use of tractors and various implements in preparing land for food crops, particularly rice, and in cultivating cash crops such as cloves and coconuts.

Two Ferguson tractors and suitable implements for use with them have been purchased and the first use to which they were put was the preparation of land for the 1953 rice crop. One tractor was sent to Pemba and one stationed on the Cheju rice plain in Zanzibar.

Rice cultivators' land is being ploughed with the disc plough for one cent per square yard (Shs. 48/40 per acre) and harrowed for a quarter of this rate. A major problem—that of how to ensure payment in advance for the hire of the tractor, a condition which is considered essential to the success of the scheme—was partly overcome by the formation of several rice growers co-operative societies which were able to obtain outside credit and thus pay for the mechanical cultivation of the members' fields.

Under the conditions prevailing at the end of the year, the Ferguson tractor was able to do excellent work. Great interest was aroused and there was a good demand for ploughing which became very popular. No work other than cultivation of rice fields has yet been undertaken.

Consideration is being given to another, greatly expanded, scheme along the same lines, an increase in rice production being the main object.

J. Tsetse and Trypanosomiasis Survey.

The findings of Mr. D. L. Johns, a Tsetse and Trypanosomiais Research Officer who made a study of the problem in Zanzibar under an earlier Colonial Development and Welfare Scheme, indicated that the sole vector, *Glossina austeni*, normally breeds in the bush growing on the coral rag to the east and south of the island and occurs in the plantation areas of the west only when conditions become suitable by the growth of weeds and shrubs resulting from poor husbandry. A proposal by officers of the East African Tsetse and Trypanosomiasis Research and Reclamation Organisation to study the prospects of eliminating the fly and the disease from the plantation areas, where the cattle are mainly kept, led to this present scheme.

An area of twenty square miles of typical clove and coconut plantation country was selected; it is bordered on the east by the coral country and on the west by the Masingini ridge and bisected from north to south by the Mwera river.

In this area an Assistant Agricultural Officer, who was given some initial training in *austeni* country in Kenya by the courtesy of the Veterinary Department there, has completed half of a year's programme. Commencing on 1st July, two teams of searchers with bait oxen have systematically covered the twenty square mile area and mapped the occurrence of tsetse flies and pupæ. Concurrently an examination of all the cattle living in the area has been made in order to assess the distribution and extent of trypanosomiasis.

Some 7.3 per cent of the 751 cattle examined were found positive for trypanosomiasis and treated with antrycide. In individual herds the percentage was sometimes much higher.

Flies have been found breeding in thickets on the coral area to the east of the block and to a much lesser extent in clumps of bush in the valley of the Mwera river. Broadly speaking no breeding has been observed in the actual plantations although many places were seen which appeared ideal.

Gangs of labourers are now engaged in destroying the breeding places of the fly by cutlassing the bush. This will be followed by a second survey to ascertain if the fly has resorted to other breeding places. The effect on the health of the animals of the area will be studied thereafter.

The main problem appears to be one of maintenance, for when the cutlassed thickets grow again they will doubtless be re-infested with fly and at present there appears to be no means of preventing this.

K. Pineapple Canning Scheme.

A loan of £23,000 has been approved from Colonial Development and Welfare Funds, for the construction of a pineapple canning factory. No activities under this new scheme have yet been commenced.

3. Distribution of Planting Material.

Owing to the unseasonable weather a large proportion of the planting material produced at Kizimbani and on the other stations was not taken by planters. And much of such planting material of permanent tree crops

as was planted out subsequently died. A list of the quantities of material issued is shown as an appendix. Most of the ground crop seed is distributed free while seedlings and worked plants of permanent crops are sold for a fraction of the cost of production.

4. Government Plantations.

In spite of a serious fall in the price of copra and increased cost of labour, the Government plantations section of the department showed a net profit of £8,555. This was principally due to the enhanced value of cloves although only a small harvest was reaped. The Plantations section endeavours to run as a commercial unit although in recent years a considerable "ploughing back" of profits has taken place by new plantings of cocoa and other crops which are not yet remunerative.

The clove harvest was small but was very thoroughly and carefully picked. The following table compares this season's crop with previous years:—

Season	*Green cloves*	*Dry cloves*	*Dry stems*	*Average price cloves per* 100 *lb.*
	lb.	*lb.*	*lb.*	*Shs.*
1951-52	11,126 ...	3,502 ...	1,049 ...	398.29
1950-51	180,944 ...	59,572 ...	15,923 ...	145.40
1949-50	281,491 ...	95,601 ...	24,467 ...	83.39
1948-49	48,792 ...	15,951 ...	4,828 ...	68.24
1947-48	11,202 ...	3,691 ...	1,048 ...	47.04

A small quantity of cloves will be reaped in the first few months of 1953 as part of the 1952/53 crop but by the end of 1952 the bulk of the crop was in. This amounted to approximately 27,850 lb. of dry cloves which sold for an average price of Shs. 739.00, a very high figure. It is pleasing to record that the high quality of Government Plantation produce invariably brings in top prices in the open market.

Unlike cloves, the coconut season is a calendar year. Comparative figures for 1952 and previous years are as follows:—

Year	*Nuts gathered*	*Copra made tons*	*Nuts per ton of copra*	*Copra price realised per* 100 *lb.*
				Shs.
1952	2,595,576 ...	338.83 ...	6,542 ...	36.31
1951	1,846,194 ...	239.47 ...	6,725 ...	59.65
1950	2,815,289 ...	340.78 ...	7,165 ...	47.08
1949	3,081,695 ...	385.26 ...	6,540 ...	37.57
1948	2,143,733 ...	264.44 ...	6,616 ...	33.40

The season's harvest was a good one but prices were most disappointing.

5. Produce Inspection.

Clove exports remained at a normal level but the high prices encouraged far more adulteration than usual and special measures were adopted to ensure that Pemba cloves were free from adulterating matter before release to the Zanzibar exporters. The remarkable growth of an export trade in well prepared copra owned much to the activities of the Produce Inspection section which, by keeping up rigid standards when inspecting copra prior to export, effectively stopped a natural tendency to cash in on high copra prices, thus turning a select and valuable trade into a free-for-all at the expense of quality.

The figures for examinations of cloves, clove-stems and copra under the Adulteration of Produce Decree are given below. This examination takes place prior to sale in the local market in Zanzibar. Pemba produce is also effectively screened at Pemba ports before leaving that island.

Cloves (bags)

Origin	*Deliveries*	*Passed*	*Failed for* *Excessive moisture*	*Extraneous matter*	*Percentage of failure*
Zanzibar	19,612	17,349	1,790	473	12
Pemba	62,958	57,117	1,940	3,901	9
Total ...	82,570	74,466	3,730	4,374	10

Clove-stems (bags)

Origin	*Deliveries*	*Passed*	*Failed for* *Excessive moisture*	*Extraneous matter*	*Percentage of failure*
Zanzibar	3,802	3,792	3	7	0.3
Pemba	24,940	24,120	820		3.3
Total ...	28,742	27,912	830		2.9

Copra (bags)

Origin	*Deliveries*	*Passed*	*Failed for* *Excessive moisture*	*Extraneous matter*	*Percentage of failure*
Zanzibar	128,640	122,064	6,576	–	5
Pemba	69,331	69,331	–	–	–
Total ...	197,971	191,395	6,576	–	3

At the preliminary inspection of copra in Pemba, four per cent was failed.

Re-inspection and grading is undertaken prior to export. 63,040 bales of cloves and 2,508 tons of copra were dealt with in 1952. Coconut oil inspections prior to export are made after the oil has been put into drums and the samples are sent to the Chemical Laboratory for examination. Some sixty-six tons of chillies were also inspected prior to export.

6. Chemical Laboratory.

For the third year, no Government Chemist has been on the staff and laboratory work was restricted to routine analysis. No investigational work could be undertaken. Some 1,934 samples, of which 1,860 came from Government Departments, were examined this year. There has been a steady increase in samples from police and public health sources over the last few years. The bulk of this work is made up of samples of coconut oil and clove oil prior to export, cattle dip fluid, water from the pumping stations, milk and exhibits in police cases.

Private samples derive largely from oil millers, who wish to determine the quantity of residual oil in cake, and from firms of importers in connection with insurance claims for sea water damage.

7. Principal Agricultural Legislation.

The following is a list of the more important agricultural legislation promulgated during the year:—

			Date
Decree	No. 15	A Decree to Amend the Clove Growers' Association Decree.	9.4.52
		This amendment enables the Association to prepare oil of limes for a period of five years from such date as the British Resident may appoint.	
Decree	No. 16	A Decree to regulate the Manufacture of Oil of Limes.	9.4.52
		This decree prohibits the manufacture of oil of limes without licence and provides for the granting of such licences.	
Decree	No. 22	A Decree to Amend the Adulteration of Produce Decree.	4.10.52
		The amendment provides a more suitable definition for adulterated copra and a new one for chillies.	
Government Notice	No. 33	The Animal Diseases Decree, 1948. Establishment of quarantine station at Wete.	22.3.52
,,	Nos. 58 & 59	The Defence (Land Regulations and Personal Services) Regulations, 1943. Provide for the compulsory planting of pulses or sweet potatoes and of cassava.	8.5.52
,,	No. 72	The Clove Growers' Association Decree. The fixed buying prices of cloves and stems offered by the Clove Growers' Association for the season.	26.6.52
,,	No. 96	The Agricultural Produce Export Decree. Specifies the weight, etc., of receptacles in which cloves are exported.	1.8.52
,,	No. 117	The Adulteration of Produce Decree. Declaration of clove stems and chillies to be produce for purposes of the Decree.	26.9.52
,,	Nos. 128 & 129	The Defence (Land Regulations and Personal Services) Regulations, 1943. Provide for the compulsory planting of rice.	28.10.52

A. K. BRIANT,
Director of Agriculture

8th April, 1953

Appendix I

STATEMENT OF REVENUE AND EXPENDITURE OF THE GOVERNMENT PLANTATIONS

Revenue

	Kidichi £	*Selem* £	*Mtoni* £	*Chukwani* £	*Total* £
Cloves and stems	9,254	781	216	1	10,252
Copra	7,034	1,514	2,998	1,829	13,375
Coconuts	120	9	213	49	391
Coconut crops	22	13	255	53	343
Miscellaneous	216	52	269	49	586
Leased plantations	–	60	–	–	60
Hire of Lorry	14	6	6	3	29
Rent of quarters	24	7	9	7	47
Total ...	16,684	2,442	3,966	1,991	25,083
Deduct value of produce brought forward	623	5	560	349	1,537
	16,061	2,437	3,406	1,642	23,546
Add value of produce carried forward	1,649	97	722	293	2,761
Total ...	17,710	2,534	4,128	1,935	26,307

Expenditure

	Kidichi £	*Selem* £	*Mtoni* £	*Chukwani* £	*Total* £
Personal Emoluments:					
Headquarters staff	604	101	201	101	1,007
Field staff	784	387	312	126	1,609
Total ...	1,388	488	513	227	2,616
Other charges:					
Travelling and transport ...	91	68	39	22	220
Materials and tools	89	54	8	8	159
Labour	7,325	2,015	2,134	2,156	13,630
Repairs to buildings	114	202	155	47	518
Lorry transport and Maintenance	125	93	62	31	311
Cost of Living Allowance Increase 5 per cent	171	52	50	21	294
	7,915	2,484	2,448	2,285	15,132
Total personal emoluments and other charges	9,303	2,972	2,961	2,512	17,748
Profit	8,407	–	1,167	–	9,574
Loss	–	438	–	577	1,015
				Net profit	£8,559

Appendix II

DISTRIBUTION OF PLANTING MATERIAL

Areca nut, seedlings	...	Nos.	50
Artichokes, Jerusalem	...	lb.	10
Avocado pear, grafted	...	Nos.	6
Banana, suckers	...	,,	840
Bambara nuts	...	lb.	4
Betel leaf, seedlings	...	Nos.	4
Beans, cluster	...	lb.	3
Beans, white haricot	...	,,	4
Carambola, seedlings	...	Nos.	10
Cassava, cuttings	...	,,	100,650
Chillie, seedlings	...	,,	259,658
Clove, seedlings	...	,,	159,716
Cocoa, seedlings	...	,,	15,037
Coconut, seedlings	...	,,	5,027
Coffee, seedlings	...	,,	8,230
Coffee, seed	...	lb.	22
Cow peas	...	,,	4
Derris, cuttings	...	Nos.	82,100
Durian, seedlings	...	,,	111
Eugenia aquea, seedlings	...	,,	19
Eugenia malaccensis, seedlings	...	,,	29
Fig, cuttings	...	,,	18
Gram, green	...	lb.	117
Grapefruit, budded	...	Nos.	159
Ginger, rhizomes	...	lb.	10
Groundnuts	...	,,	98
Guava, Chinese, seedlings	...	Nos.	17
Guava, local, seedlings	...	,,	10
Jack-fruit, seedlings	...	,,	42
Kapok, seedlings	...	,,	260
Kudzu, tropical seed	...	lb.	60
Lemon, rough, seedlings	...	Nos.	41

DISTRIBUTION OF PLANTING MATERIAL — *(Contd.)*

Lemon, smooth, budded	...	Nos.	38
Lime, budded	...	,,	526
Lime, seedlings	...	,,	491
Litchi, marcotts	...	,,	60
Maize seed, white	...	lb.	1,418
Maize seed, yellow	...	,,	262
Malaya apple, cuttings	...	Nos.	13
Mandarins, budded	...	,,	347
Madras Thorn, seedlings	...	,,	5,666
Mango	...	,,	17
Nutmeg, seedlings	...	,,	90
Okra	..	lb.	2
Oranges, budded	...	Nos.	1,289
Orange, seed	...	lb.	2
Pineapple, suckers	...	Nos.	13,150
Pepper, seedlings	...	,,	90
Pomelo, budded	...	,,	52
Paspalum notatum, baskets	...	,,	179
Pigeon peas	...	lb.	4
Rose apple, seedlings	...	Nos.	32
Rambutan, seedlings	...	,,	547
Rice, seedlings	...	,,	70,000
Rice, seed	...	lb.	1,491
Sapodilla, marcotts	...	Nos.	12
Sapodilla, seedlings	...	,,	65
Soursop, seed	...	lb.	1
Soursop, seedlings	...	Nos.	3
Sunflower, seed	...	lb.	23
Sweet potatoes, vines	...	Nos.	101,300
Tannia, suckers	...	,,	3,800
Wax Jambu, cuttings	...	,,	21
Yams	...	lb.	1,985

Appendix III

DOMESTIC EXPORTS, 1952

Items	*Unit of Quantity*	*Quantity*	*Value*	*Percentage of Total value*
	Cental		£	
Cloves	of 100 lb.	99,095	2,969,358	74.75
Clove bud and stem oil	lb.	180,429	134,659	3.39
Copra	ton.	2,560	146,335	3.68
Coconuts	cwt.	17,506	11,651	0.29
Oil cake	cwt.	97,507	126,762	3.19
Soap, common and toilet	cwt.	1,952	5,633	0.14
Coconut oil	cwt.	105,251	479,478	12.07
Mangrove bark	ton.	----	—	--
Chillies	cwt.	1,313	12,213	0.31
Fruit, fresh	cwt.	11,621	6,228	0.16
Bêche-de-mer	cwt.	143	919	0.02
Tobacco, unmanufactured	lb.	28,385	943	0.02
Ox hides	cwt.	693	7,384	0.19
Skins, sheep and goat	cwt.	208	3,419	0.09
Livestock	No.	—	--	—
Forest products	value	—	2,344	0.06
Kapok	cwt.	542	6,852	0.17
Fibres, manufactured	ton.	60	5,025	0.13
Shells, marine	cwt.	5,669	29,389	0.74
Fish, dried or salted	cwt.	75	595	0.01
Fish, fresh	cwt.	14	57	—
Lime	cwt.	32,728	3,819	0.10
Seaweed	ton.	144	6,840	0.17
Other unclassified natural products Other articles	value	—	12,752	0.32
			3,972,655	100.00

Appendix IV

APPROXIMATE PRODUCTION OF CLOVES IN FRASILAS OF 35 lb. FOR 35 CROP YEARS

(1st July to 30th June)

(Based on receipts of cloves at the Central Market and C.G.A.)

Season	*Zanzibar Frasilas*	*Pemba Frasilas*	*Total Frasilas*	*Mean crop per season in 5-year periods Frasilas*
1917/18	63,958	234,239	298,197	—
1918/19	259,273	565,229	824,502	—
1919/20	93,847	168,703	262,550	—
1920/21	231,831	316,446	548,277	—
1921/22	65,819	200,983	266,802	440,065
1922/23	291,417	690,498	981,915	576,809
1923/24	75,027	236,767	311,794	474,267
1924/25	240,952	520,490	761,442	574,046
1925/26	219,192	392,622	611,814	586,753
1926/27	203,843	529,186	733,029	679,398
1927/28	190,370	500,382	690,752	621,766
1928/29	74,828	125,740	200,568	599,521
1929/30	318,647	610,296	928,943	633,021
1930/31	51,796	201,320	253,116	561,281
1931/32	175,070	760,786	935,856	601,847
1932/33	242,772	244,594	487,366	561,170
1933/34	146,098	781,090	927,188	706,494
1934/35	360,037	503,415	863,452	693,395
1935/36	65,938	232,571	298,509	702,474
1936/37	45,096	351,568	396,664	592,636
1937/38	446,500	909,416	1,355,916	768,346
1938/39	39,879	115,211	155,090	613,926
1939/40	168,041	501,474	669,515	575,139
1940/41	146,323	575,277	721,600	659,757
1941/42	297,578	889,550	1,187,128	817,850
1942/43	40,049	223,691	263,740	599,414
1943/44	263,423	777,218	1,040,641	776,525
1944/45	200,417	459,396	659,813	774,584
1945/46	26,493	161,075	187,568	667,778
1946/47	170,280	924,329	1,094,609	649,074
1947/48	30,914	280,986	311,900	658,906
1948/49	81,700	310,971	392,671	549,312
1949/50	153,888	430,253	584,141	514,178
1950/51	158,588	1,081,786	1,240,374	724,739
1951/52	45,892	290,007	335,899	572,977
Average for 35 seasons	162,451	459,930	622,381	—

MONTHLY AND ANNUAL RAINFALL TOTALS FOR THE YEAR 1952 FOR STATIONS IN ZANZIBAR AND PEMBA

		Jan.	Feb.	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	Total 1952	Total 1951
Clove Growing Areas :															
Kizimbani	Rain ...	2.26	.31	3.92	6.94	7 38	4.21	0.69	2.19	3.37	3.52	3.01	3 98	42.78	90.14
	Wet Days ...	5	6	12	20	12	14	6	13	16	18	13	11	146	203
Mkwajuni	Rain ...	0.11	0.82	4.82	3.08	8.49	3.63	1.18	2.10	1.00	2.90	3.48	0.79	32.40	74.76
	Wet Days ...	2	2	8	9	12	14	6	15	6	10	7	3	94	150
Selem	Rain ...	3.71	1.67	3.69	3.87	5.14	2.90	0.77	1.83	3.06	3.68	3.36	2.35	36.03	85.14
	Wet Days ...	6	5	9	16	10	15	5	12	9	13	14	11	125	176
Mkokotoni	Rain ...	1.08	1.37	6.92	3.13	7.45	2.20	0.47	3.43	1.49	5.43	3.17	1.91	38.06	86.79
	Wet Days ...	4	3	5	7	10	10	4	14	5	10	6	2	80	134
Mwera	Rain ...	...	...	6.30	4.35	2.95	2.25	1.95	0.70	1.50	5.55	3.95	2.65	...	72.43
	Wet Days ...	...	...	6	8	5	4	3	4	6	10	6	6	...	102
Kigomasha	Rain ...	0.32	0.59	2.16	2.69	11.57	7.67	1.56	3.46	7.08	3.42	4.38	0.33	45.23	73.86
	Wet Days ...	2	2	4	11	13	17	10	16	12	12	10	2	111	140
Matangatwani	Rain ...	0.41	0.59	4.97	4.33	7.70	6.60	1.65	1.54	1.93	7.89	6.65	0.81	45.07	93.55
	Wet Days ...	3	3	8	11	16	23	14	11	11	13	9	8	130	157
Wete	Rain ...	0.62	0.46	6.86	5.39	9.50	8.50	0.64	1.31	2.75	5.53	9.57	3.88	55.01	98.27
	Wet Days ...	4	2	8	13	14	20	8	9	9	12	11	9	119	174
Mkoani	Rain ...	1.84	1.16	2.65	4.60	10.94	8.62	0.49	0.71	1.38	1.64	6.95	4.83	45.82	94.45
	Wet Days ...	2	1	7	20	18	22	7	9	9	6	12	12	125	146
Mtambile	Rain ...	2.99	3.58	3.60	7.60	7.10	6.75	0.11	0.45	1.68	1.99	3.95	10.38	50.18	103.80
	Wet Days ...	10	9	8	15	20	24	7	13	9	11	9	16	151	191
Limbani	Rain ...	0.14	0.29	6.49	5.88	8.38	7.42	1.03	1.40	2.06	5.61	4.75	4.16	47.61	95.54
	Wet Days ...	1	2	7	11	13	15	9	9	8	10	8	8	101	134
Wesha	Rain ...	1.64	0.17	4.49	7.01	11.29	9.74	0.27	0.91	1.55	2.61	3.19	4.26	47.13	105.13
	Wet Days ...	4	2	7	18	15	23	5	12	6	7	13	13	125	180
Chake Chake	Rain ...	1.39	1.24	3.67	7.05	7.79	7.93	...	0.37	...	...	...	...	41.19	...
	Wet Days ...	4	3	11	17	11	19	...	5	...	...	...	...	108	...
Chambani	Rain ...	0.81	1.69	3.68	6.56	7.34	7.07	0.05	0.31	2.22	0.59	14.3	2.27	34.02	80.73
	Wet Days ...	1	5	9	16	12	15	1	4	4	4	6	7	84	97
Non-Clove Growing Areas :															
Chukwani	Rain ...	2.45	1.74	3.14	4.84	6.39	0.92	0.14	1.01	1.01	3.48	3.71	2.71	31.54	72.13
	Wet Days ...	7	5	11	15	8	8	4	9	6	7	12	14	107	149
Victoria Gardens	Rain ...	0.57	0.56	4.22	4.66	4.81	1.62	0.09	0.55	2.02	1.99	4.09	4.42	29.60	84.44
	Wet Days ...	5	5	8	10	9	11	2	7	10	11	11	9	98	156
Chwaka	Rain ...	0.83	0.06	3.25	4.44	6.22	3.82	0.68	1.19	0.74	0.38	2.05	1.17	24.83	68.21
	Wet Days ...	6	2	10	10	10	11	9	10	3	5	6	5	87	143
Hanyegwa Mchana	Rain ...	0.13	0.24	3.13	5.48	6.01	2.87	0.30	0.87	1.91	0.77	1.47	1.94	25.12	71.25
	Wet Days ...	2	4	10	18	11	13	2	8	5	5	5	6	89	121
Makunduchi	Rain ...	9.15	1.58	1.63	9.63	8.53	5.58	0.39	0.53	0.75	0.46	3.22	2.88	44.33	68.67
	Wet Days ...	6	3	7	22	12	20	6	5	7	6	6	7	107	99
Muongoni	Rain ...	0.09	0.68	4.59	5.06	8.54	2.36	0.53	0.45	1.64	2.34	2.47	1.37	30.12	63.78
	Wet Days ...	2	4	10	16	11	14	5	8	8	6	8	5	97	150